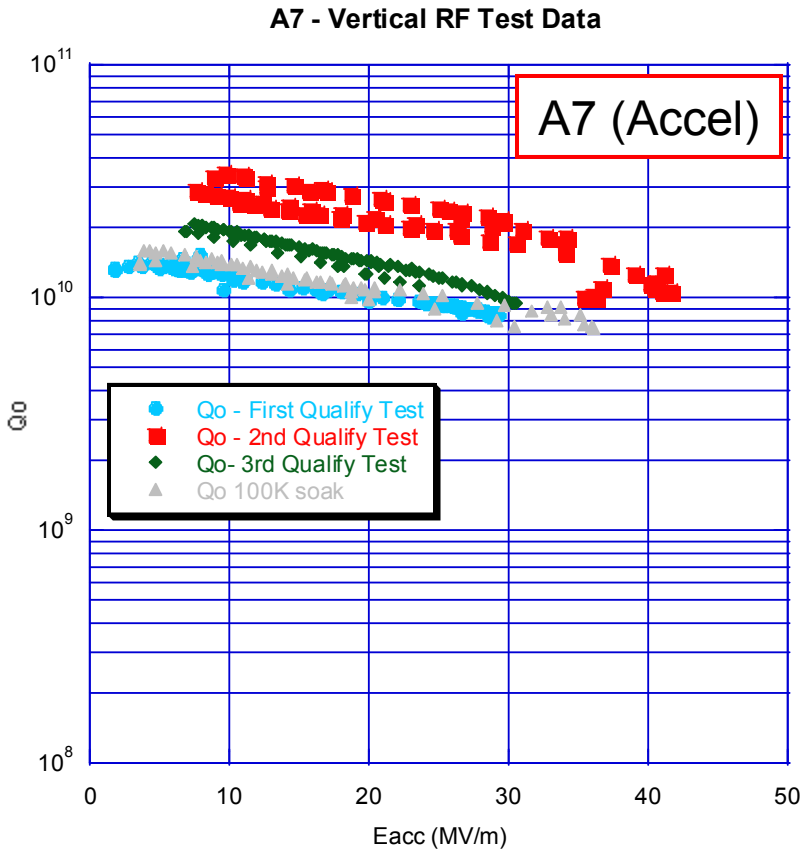
Overview of US work on ACCEL7

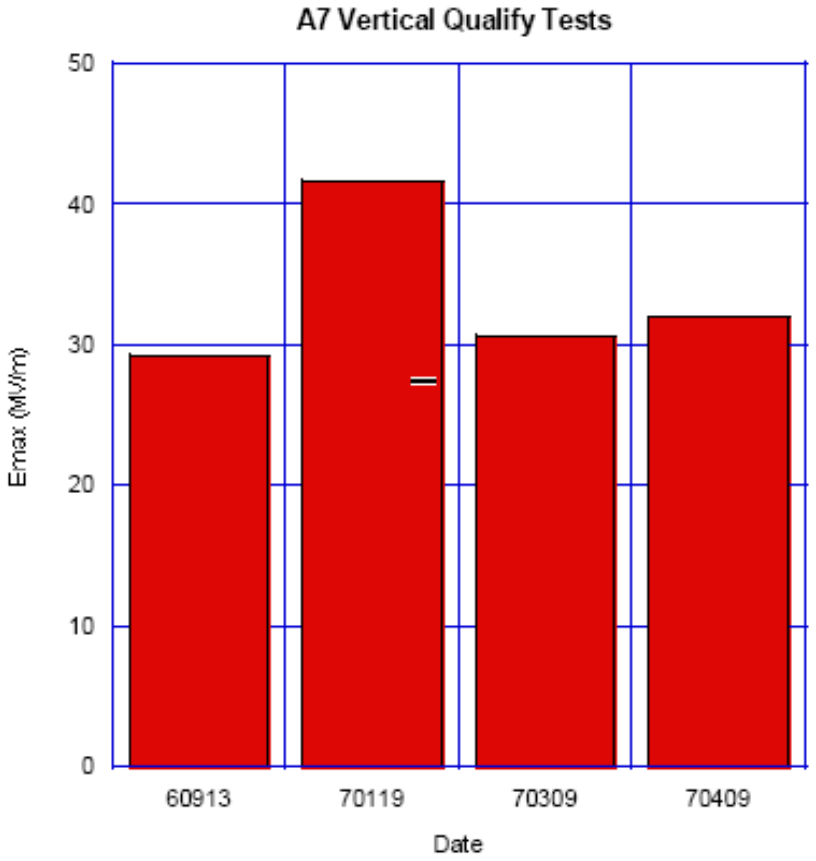
C.M. Ginsburg (Fermilab)

Update June 5, 2008

JLab ACCEL7 Results

J. Mammosser, TTC Meeting at Fermilab, April 2007





All cavity processing done @JLab

Processing Recipe
J. Mammosser, TTC Meeting at Fermilab, April 2007

- Processing recipe
  - –Degrease
  - –Electropolishing (20 μm)
  - –Degrease
  - –First HPR+dry
  - –First cleanroom assembly
  - –Second HPR+dry
  - –Final cleanroom assembly
  - –Evacuation and leak check
  - –Low temperature (110 C) bake

Note: all cavities get 150 um bulk EP

Material Removal (microns)
R. Geng, AES Meeting at JLab, Aug 2007

	1st test	2nd test	3rd test	4th test
A7	172	198	224	251
A6	187	213	239	265
AES1	213	236	252	269
AES2	164	190		
AES3	177	200		
AES4	221	257	277	

Note: updates to AES2,3,4 since August 2007 are not shown

ACCEL-7
Field Flatness Measurement

Timergali Khabiboulline, Dec. 13, 2007

- π-mode frequency = 1297.54 MHz
  - Too low by about 0.5 MHz if this is "push" cavity
  - Too high by 0.15 MHz if "pull" cavity
  - field flatness slope = -12%.
- Normalization is

  $E_{acc}^2(1) + E_{acc}^2(2) + \ldots + E_{acc}^2(9) = 9$
- No eccentricity measurement
- No tuning done

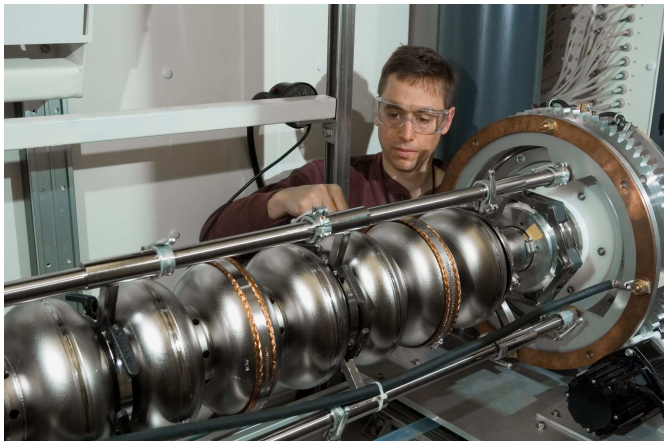
Cell #	Normalized Eacc
1	1.024
2	1.034
3	1.047
4	1.023
5	1.01
6	0.995
7	0.983
8	0.953
9	0.923

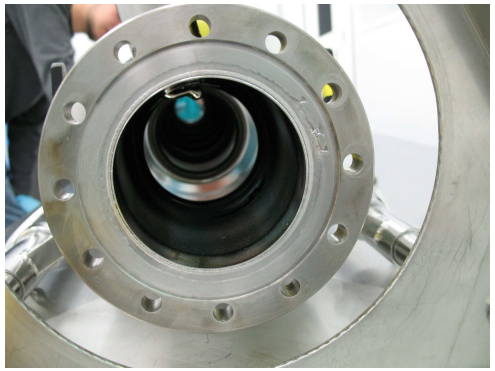
Note: Here cell # is counted from the opposite end to the input coupler port

ACCEL-7 EP at Argonne

- Average removal from the equator ~ 0.866 mil (22 microns)
- Average removal rate from the iris ~ 1.25 mil (31.9 microns)
- Average removal rate from the beam tubes ~ 0.55 mil (14 microns)

M. Kelly, priv.comm., May 12, 2008





ACCEL-7 at JLab

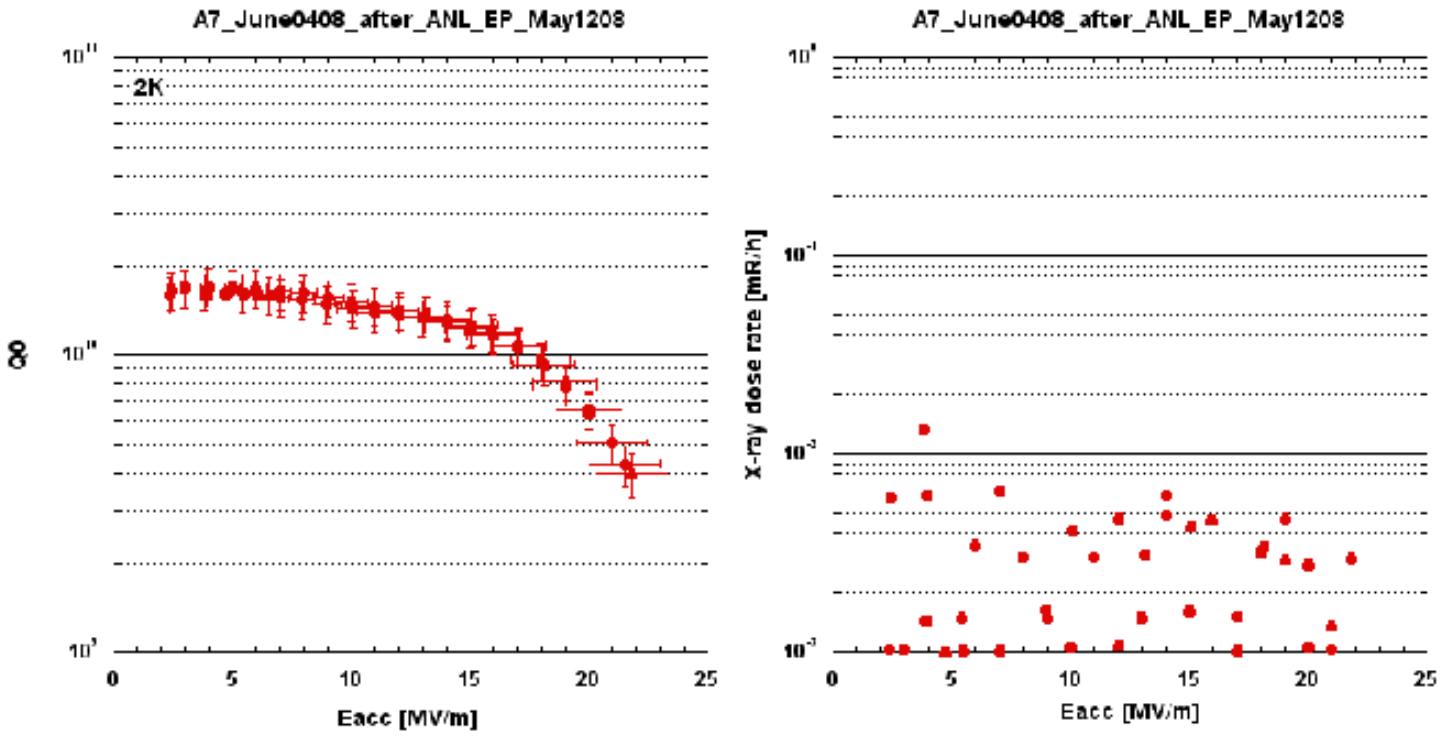
R. Geng, priv.comm., May 16, 2008

A7 arrived at JLab [May 16, 2008]. No sign of water leakage during transportation. Water PH value between 6 and 7. All flange surfaces look find and no need for polishing (the known old corrosion in NW78 is not in the sealing path). Cavity is going into US tank for ultrasonic cleaning (photo attached). Plan is to do first HPR today and then dry in clean room. There is currently some problem with our clean room quality, but I decided to accept this. This means the stop point is after the first HPR. (Otherwise, the cavity will have to wait until after Memorial Day due to our production schedule. This scenario increases the risk of bacteria growth.) My priority is to avoid bacteria by having a dry surface as soon as possible. The second HPR should be capable of removing any air-born particulate (due to reduced clean room quality).

ACCEL-7 RF Test at JLab

A7 RF test June 4, 2008

following May 12, 2008, EP 27 micron at ANL



ACCEL-7 Status/Plans

- Recent History
  - December 11, 2007: arrived at Fermilab IB4 from JLab
  - December 12, 2007: Field Flatness measurement (T. Khabiboulline)
  - December 13, 2007: Transport to Argonne for 9-cell EP commissioning (D. Olis)
  - Jan-May 2008: Ultrasonic thickness measurement (M. Kelly)
  - May 12, 2008: EP at Argonne (first 9-cell!) (M. Kelly)
  - May 14 2008: Sent to JLab filled with UPW for HPR and test
  - May 22 2008: Ultrasonic cleaning, first HPR and first assembly are done. Second HPR scheduled for Friday May 23 (R. Geng)
  - cold vertical RF test June 4, 2008 at JLab (R. Geng)

- Plans